



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

MRW

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/695,821	10/30/2003	Tom Francke	19200-000023/US	7186
30593	7590	03/10/2005	EXAMINER	
HARNESS, DICKEY & PIERCE, P.L.C. P.O. BOX 8910 RESTON, VA 20195			HO, ALLEN C	
			ART UNIT	PAPER NUMBER
			2882	

DATE MAILED: 03/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/695,821	FRANCKE, TOM	
	<b>Examiner</b>	<b>Art Unit</b>	
	Allen C. Ho	2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 30 October 2003.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-24 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 30 October 2003 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | Paper No(s)/Mail Date. _____ .  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>062004</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
|   | 6) <input type="checkbox"/> Other: _____ .                                  |

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 27c (Fig. 4a), 27d (Fig. 4b).
2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the alteration of the distance between the detector and the radiation source as claimed in claims 3 and 20 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will

Art Unit: 2882

be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Specification***

3. The disclosure is objected to because of the following informalities:

- (1) Page 6, line 23, the second "16" should be deleted.
- (2) Page 7, line 28, the first "25" should be replaced by --27--.
- (3) There is no description of Fig. 4b in the specification.

Appropriate correction is required.

***Claim Objections***

4. Claim 21 is objected to because of the following informalities: line 2, "or signal-to-noise ratio" should be deleted. Appropriate correction is required.

5. Claim 22 is objected to because of the following informalities: line 2, ""spatial resolution or" should be deleted. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1-24 recite means for grouping a large number of individual detecting elements together to form a plurality of detecting stripes. However, it is unclear what distinguishes one detecting stripe from another. Specifically, what makes a group of detecting elements a detecting stripe that is different from another one? In other words, what is the connection between a group of detecting elements in a detecting stripe?

Claims 6 and 23 recite a number. It is unclear what is this number.

Claims 7 and 24 recite a plurality of detecting stripes, each has a varying width. It is unclear what defines the width of a detecting stripe and how the width can be varied.

***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1, 2, 4-6, 8-11, 13, 14, and 17-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Possin *et al.* (U. S. Patent No. 6,167,110).

With regard to claims 1, 2, 8, and 17, Possin *et al.* disclosed a scanning-based radiation detector apparatus for recording an image of an object comprising: a one-dimensional detector (20) exposed to a fan-shaped beam (26) of ionization radiation from a radiation source (24) as transmitted through the object, and arranged for repeated one-dimensional imaging of the fan-shaped beam of ionization radiation, the one-dimensional detector being of the kind wherein charges or photons generated by interaction between the fan-shaped beam of ionization radiation

and a detection medium and traveling in a direction essentially perpendicular to the fan-shaped beam of ionization radiation, are detected (column 6, lines 13-27); and a device for moving the one-dimensional detector and the fan-shaped beam of ionization radiation relative to the object while the one-dimensional detector is arranged to repeatedly detect to thereby create an image of the object (column 2, lines 62-64); wherein the one-dimensional detector has a detecting arrangement for detecting the charges or photons, which comprises a large number of individual detecting elements (23), and means (22) for grouping the large number of individual detecting elements together to form a plurality of detecting stripes (22) side-by-side, which plurality of detecting stripes are all pointing towards a selected single point (column 5, lines 51-62).

Claims 4-6 failed to set forth additional structural limitation. MPEP § 2114. Accordingly, claims 4-6 are rejected with claim 1.

With regard to claims 9-11, Possin *et al.* disclosed the scanning-based radiation detector apparatus of claim 1, wherein the large number is at least 100,000 (column 4, lines 22-38; 64 detecting elements per stripe X 2048 stripes = 131,072 detector elements).

With regard to claims 13 and 14, Possin *et al.* disclosed the scanning-based radiation detector apparatus of claim 1, wherein the detecting area of each of the large number of individual detecting elements measures less than 0.25 mm<sup>2</sup> (column 4, lines 22-38; 100 µm X 500 µm = 0.05 mm<sup>2</sup>).

With regard to claims 18 and 19, Possin *et al.* disclosed a method for recording an image of an object comprising the steps of: indicating a distance between a radiation source (24) of ionization radiation and a one-dimensional detector (20) (this is inherent since the angle of each detecting stripe is a function of the distance between the radiation source and the detector);

grouping the large number of individual detecting elements together to form a plurality of detecting strips (22) side-by-side depending on the indicated distance; exposing the one-dimensional detector to a fan-shaped beam of ionizing radiation beam from the radiation source as transmitted through the object; and moving the one-dimensional detector and the fan-shaped beam of ionizing radiation relative to the object while repeatedly detecting by the one-dimensional detector to thereby create an image of the object (column 2, lines 62-64).

10. Claims 1, 2, 4-6, 8, and 17-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Chen *et al.* (U. S. Patent No. 4,068,306).

With regard to claims 1, 2, 8, and 17, Chen *et al.* disclosed a scanning-based radiation detector apparatus for recording an image of an object comprising: a one-dimensional detector (12) exposed to a fan-shaped beam (16) of ionization radiation from a radiation source (10) as transmitted through the object, and arranged for repeated one-dimensional imaging of the fan-shaped beam of ionization radiation, the one-dimensional detector being of the kind wherein charges or photons generated by interaction between the fan-shaped beam of ionization radiation and a detection medium and traveling in a direction essentially perpendicular to the fan-shaped beam of ionization radiation, are detected; and a device for moving the one-dimensional detector and the fan-shaped beam of ionization radiation relative to the object while the one-dimensional detector is arranged to repeatedly detect to thereby create an image of the object (this is a CT); wherein the one-dimensional detector has a detecting arrangement for detecting the charges or photons, which comprises a large number of individual detecting elements (ionization chambers), and means for grouping the large number of individual detecting elements together to

Art Unit: 2882

form a plurality of detecting stripes (22, 20, 22) side-by-side, which plurality of detecting stripes are all pointing towards a selected single point.

Claims 4-6 failed to set forth additional structural limitation. MPEP § 2114.

Accordingly, claims 4-6 are rejected with claim 1.

With regard to claims 18 and 19, Chen *et al.* disclosed a method for recording an image of an object comprising the steps of: indicating a distance between a radiation source (10) of ionization radiation and a one-dimensional detector (12) (this is inherent since the detector is located a distance away from the source); grouping the large number of individual detecting elements together to form a plurality of detecting strips (22, 20, 22) side-by-side depending on the indicated distance; exposing the one-dimensional detector to a fan-shaped beam of ionizing radiation beam from the radiation source as transmitted through the object; and moving the one-dimensional detector and the fan-shaped beam of ionizing radiation relative to the object while repeatedly detecting by the one-dimensional detector to thereby create an image of the object (this is a CT).

#### ***Claim Rejections - 35 USC § 103***

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 3, 6, 12, 15, 16, and 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Possin *et al.* (U. S. Patent No. 6,167,110) as applied to claims 1 and 18 above.

With regard to claims 3 and 20, Possin *et al.* disclosed the scanning-based radiation detector apparatus of claim 1 and the method of claim 18. However, Possin *et al.* failed to disclose that the means for grouping is arranged to regroup the large number of individual detecting elements if the distance between the one-dimensional detector and the radiation source is altered.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to regroup the large number of individual detecting elements if the distance between the one-dimensional detector and the radiation source is altered. Since the angle of each detecting stripe depends on the distance between the one-dimensional detector and the radiation source, a person would be motivated to regroup (reposition) the detecting elements such that the detecting elements in the same detecting stripe are all pointing toward the radiation source.

With regard to claim 12, Possin *et al.* disclosed the scanning-based radiation detector apparatus of claim 1. However, although Possin *et al.* disclosed that larger numbers of detecting elements could be used depending upon the particular application (column 4, lines 22-38), Possin *et al.* failed to disclose a scanning-based radiation detector that comprises at least 1,000,000 detecting elements.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide at least 1,000,000 detecting elements, since a person would be motivated to provide enough detecting elements as required by the particular application.

With regard to claims 15 and 16, Possin *et al.* disclosed the scanning-based radiation detector apparatus of claim 1. However, Possin *et al.* failed to disclose that the detecting area of each of the large number of individual detecting elements measures less than 0.0025 mm<sup>2</sup>.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to detecting elements that have a detecting area less than  $0.0025 \text{ mm}^2$ , since a person would be motivated to increase the spatial resolution of the detector.

With regard to claims 21 and 22, Possin *et al.* disclosed the method of claim 18, wherein the plurality of detecting stripes having a width. However, Possin *et al.* failed to disclose that the width depends on required spatial resolution and signal noise ratio.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the plurality of detecting stripes having a width depending on required spatial resolution and signal noise ratio, since a person would be motivated to obtain images of high quality by optimizing the detector.

With regard to claim 23, Possin *et al.* disclosed the method of claim 18. However, Possin *et al.* failed to disclose that the number of detecting stripes corresponds to a selected required maximum detecting time.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a number of detecting stripes corresponds to a selected required maximum detecting time, since a person would be motivated to optimize detecting efficiency.

13. Claims 7 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen *et al.* (U. S. Patent No. 4,068,306) as applied to claims 1 and 18 above.

With regard to claims 7 and 24, Chen *et al.* disclosed the scanning-based radiation detector apparatus of claim 1 and the method of claim 18. However, Chen *et al.* failed to disclose that each detecting stripe has a varying width.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to adjust the widths of each detecting stripe, since a person would be motivated to provide detecting stripes on the periphery with an appropriate width to detect unattenuated x-ray beam depending on the dimension of the body.

### *Conclusion*

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

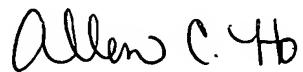
- (1) Kojima *et al.* (U. S. Pub. No. 2003/0108147 A1) disclosed a radiation detector comprising a plurality of detector stripes, each detector stripe comprises a plurality of detecting elements.
- (2) Von Der Haar (U. S. Patent No. 6,535,571 B2) disclosed a detector comprising a means for grouping individual detecting elements.
- (3) Francke (U. S. Patent No. 6,477,223 B1) disclosed a CT comprising an array of ionization chambers.
- (4) Charpak (U. S. Patent No. 5,959,302) disclosed a high resolution radiographic imaging device.
- (5) Charpak (U. S. Patent No. 5,604,783) disclosed a medical imaging device.
- (6) Glover *et al.* (U. S. Patent No. 4,559,639) disclosed a CT detector array comprising ionization chambers.
- (7) Barber (U. S. Patent No. 4,070,707) disclosed a CT detector array comprising ionization chambers.

Art Unit: 2882

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen C. Ho whose telephone number is (571) 272-2491. The examiner can normally be reached on Monday - Friday from 8:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward J. Glick can be reached at (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Allen C. Ho  
Primary Examiner  
Art Unit 2882

07 March 2005